

REMARKS

In response to the Notice of Non-Compliant Amendment mailed May 11, 2009, Applicant includes the proper signature format in accordance with 37 CFR 1.4.

Claims 1-3, 5-11 and 14-17, 19-22, are pending in the application. Claims 1, 10, and 11 have been amended, and claims 4, 12-13, 18, and 23 have been previously cancelled. Claims 24-26 are newly added to the application. No new matter has been introduced by the amendment.

REJECTION UNDER 35 U.S.C. §103(a)

Claims 1-3 and 5-11, 14-17, and 19-23 have been rejected over De in view Hiyamizu et al. Although Buchwalter et al. is cited in paragraph 3 of the instant Office Action, paragraph 1 states that present rejection is based on De in view Hiyamizu et al. Further, Buchwalter et al. is not mentioned in the remaining text of the Office Action. Accordingly, the applicants assume that Buchwalter et al. is no longer being relied upon in support of the obviousness rejection. This rejection is overcome in view of the amendment of claims 1, 10 and 11, together with the following remarks.

Claim 1, as amended, recites a process in which a work piece is temporarily attached to a porous work carrier by a liquefied adhesive that is drawn into the plurality of pores of the work carrier by applied vacuum pressure. A portion of the plurality of pores include pore passages that comprise at least 10% of the pore volume, and wherein the pore passages traverse the work carrier from a top side to a rear side of the work carrier. The adhesive is then hardened, while maintaining the vacuum pressure. The vacuum pressure is maintained until the solid adhesive is formed or only during an initial hardening phase of the liquefied adhesive. Following processing of the workpiece, the workpiece is released from the work carrier by action of a solvent.

A work carrier arranged in accordance with the invention is recited in amended claim 10. Specifically, the pores are configured to accommodate a

portion of a liquefied adhesive and have a workpiece in intimate contact therewith. Notably, the pores are also configured to accommodate the liquefied adhesive upon hardening of the adhesive to a solid. A portion of the plurality of pores include pore passages that comprise at least 10% of the pore volume, and wherein the pore passages traverse the work carrier from a top side to a rear side of the work carrier. The liquefied adhesive is configured to harden under continuous vacuum pressure or under vacuum pressure applied only during an initial hardening phase.

The applicants respectfully disagree with the Examiner's characterization of claim 11 as depending from claim 10 and containing limitations that are not given patentable weight. (Office Action, pg. 5). Claim 11 is an independent claim that recites a combination of a work carrier and a workpiece. The applicants assert that claim 11 is an apparatus claim and that all of the elements recited in claim 11

Claim 11, as amended, recites a combination including a work carrier and a workpiece in which a porous material has a plurality of pores at least a portion of which are interconnected. A portion of the plurality of pores include pore passages that comprise at least 10% of the pore volume. The pore passages traverse the work carrier from a top side to a rear side of the work carrier. The workpiece comprises a semiconductor wafer attached to the work carrier by an adhesive. The diameter of the work carrier is equal to the diameter of the semiconductor wafer.

The porous material is configured such that, upon application of vacuum pressure to the work carrier, the plurality of pores accommodate a portion of the adhesive in a liquid state. These pores also accommodate the liquefied adhesive upon hardening of the adhesive to a solid. The liquefied adhesive is configured to harden under continuous vacuum pressure, or under vacuum pressure applied only during an initial hardening phase. The plurality of pores are further configured to provide for flow of a solvent therethrough to dissolve the solid adhesive and release the semiconductor wafer.

De fails to suggest or disclose a work carrier that includes a plurality of pores at least a portion of which are interconnected, as acknowledged on page 3 of the instant Office Action. Further, De fails to suggest or disclose pores that are configured to accommodate a portion of a liquefied solid upon application of vacuum pressure to the work carrier. Still further, De fails to suggest or disclose applying vacuum pressure until the solid adhesive is formed or only during an initial hardening phase of the liquefied adhesive. In contrast, De simply uses an adhesive to adhere the wafer to the carrier, and does not suggest or disclose a method or work carrier in which a liquefied is drawn into an interconnected pore network by vacuum pressure, then hardened.

Hiyamizu et al. do not suggest or disclose a work carrier that accommodates the fastening of a workpiece to a porous work carrier by means of a solid adhesive that is applied in liquefied form. Further, there is no teaching of a process or structure in which the workpiece is in intimate contact with the adhesive. Instead, Hiyamizu et al. disclose a resin suction head that is permanently fastened to a metal chuck by an adhesive. Accordingly, Hiyamizu et al. do not suggest or disclose a method or structure in which a liquefied adhesive vacuum is drawn into interconnected pores under vacuum pressure that is maintained until the solid adhesive is formed, or only during an initial hardening phase of the liquefied adhesive, followed by applying a solvent to release the workpiece from the work carrier.

Since neither De nor Hiyamizu et al. suggest or disclose a process or structure in which a liquefied adhesive is temporarily drawn into an interconnected pore network, under vacuum pressure until a solid adhesive is formed or only during an initial hardening phase of the liquefied adhesive, the combination of these references fails to the applicants' invention. Accordingly, this rejection should be withdrawn

Claims 2-3, 5-9, 14-17, and 19- 21 are allowable in view the remarks pertaining to claim 1 from which they depend.

Claim 22 is allowable in view the amendment and remarks pertaining to claim 10 from which it depends.

New Claims

Claims 24-26 have been added in order that the applicants can more fully claim the subject matter of their invention. Claims 24-26 depend from claim 1 and recite relational aspects of the work carrier and the work piece. Notably, claim 24 recites that the work carrier and work piece have substantially the same diameter. (See, for example, Specification, para. 0024). Neither De nor Hiyamizu et al. suggest or disclose the recited relationship.

Claim 25 recites that the work carrier and the work piece have substantially the same perimeter configuration. (See, for example, Specification, para. 0023). Claim 26 recites that the work carrier and the work piece have corresponding flat sections. (See, for example, Specification, para. 0031 and FIG. 1). These aspects of the invention assist in generating vacuum pressure between the work carrier and the work piece. (See, for example, Specification, para. 0024). The applicants assert that relationships recited in claims 24-26 are not suggested or disclosed by De or Hiyamizu et al.

The applicants have made a novel and non-obvious contribution to the art of semiconductor fabrication technology and handling equipment. The claims at issue distinguish over the cited references and are in condition for allowance. Accordingly, such allowance is now earnestly requested.

Respectfully submitted,

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/Jasper W. Dockrey/
Jasper W. Dockrey, Reg. No. 33,868
Attorney for Applicant(s)

BRINKS HOFER GILSON & LIONE
P.O. BOX 10395
CHICAGO, IL 60610
(312)321-4200